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# *Office of Inspector General*

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***The Year 2000 Technology Challenge  
Department of Transportation***

***Report Number: FE-1999-082***

***Date Issued: April 5, 1999***





**U.S. Department of  
Transportation**

Office of the Secretary  
of Transportation

Office of Inspector General

# Memorandum

Subject: **ACTION:** The Year 2000 Technology  
Challenge, Department of Transportation  
FE-1999-082

Date: April 5, 1999

From: Kenneth M. Mead  
Inspector General

Reply To

Attn Of:

To: The Deputy Secretary

On March 15, 1999, at a hearing before the Subcommittee on Government Management, Information, and Technology, House Committee on Government Reform, and the Subcommittee on Technology, House Committee on Science, we provided our observations on the Federal Aviation Administration (FAA) and Department of Transportation (DOT) Year 2000 computer program. Our statement is provided for your information as attachment 1. It is summarized in this cover memorandum.

## **RESULTS-IN-BRIEF**

DOT has 607 mission-critical systems, 309 of which had Year 2000 problems that needed to be fixed. We have a much higher level of confidence today than we did a year ago that DOT's mission-critical systems, such as air traffic control (ATC), will be Year 2000 compliant. While a great deal of progress has been made, much remains to be done<sup>1</sup>. FAA plans to finish its work by June 30, 1999; and Coast Guard, with one exception, plans to be done by June as well. Regarding aviation industry and international Year 2000 readiness, our March 15 testimony contained recommendations to the FAA Administrator for requiring key components of the aviation industry to submit a Year 2000 compliant certification, and developing a policy for U.S. air carrier travel to other countries.

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<sup>1</sup> DOT reported that 64 percent and 85 percent of mission-critical systems were Year 2000 compliant as of March 12, 1999, and March 31, 1999, respectively. These statistics were based on information provided by Operating Administrations and were not validated by the Office of Inspector General (OIG). The OIG will validate the progress reported in the May 1999 quarterly report to the Office of Management and Budget (OMB). Our last validation was as of February 12, 1999.

## Internal Systems

FAA has fixed at least one of each mission-critical system that required repairs, and the repair work has been tested in a test-center environment. FAA is now making that same repair to multiple units of the same system at air traffic facilities in the field. For example, 65 of FAA's ATC systems have computers that must be fixed at about 3,700 locations. As of February 28, 1999, FAA had 21 of its 65 repaired mission-critical ATC systems installed at field sites. However, the remaining 44 systems are the most complex ones, requiring over 3,000 installations in the next 3 months. This implementation effort could be further complicated by local adaptations made by local technicians to ATC systems. FAA also has to include interfaces with foreign ATC systems in its end-to-end testing.

Coast Guard has no end-to-end testing strategy for interdependent systems. It is our opinion that end-to-end testing should be assigned a high priority because Coast Guard's search and rescue function is one of the affected missions. Coast Guard was significantly behind both OMB and DOT schedules. As of February 28, 1999, only 2 of its 66 repaired mission-critical systems had been implemented at field sites. Coast Guard faces a field installation challenge similar to the one facing FAA. However, it has recently accelerated the implementation work, and plans to become fully compliant by June 30, 1999, with one exception<sup>2</sup>.

No matter how extensive the search, there are no guarantees that all Year 2000 glitches will be found. So, prudent management dictates that DOT prepare workable Business Contingency and Continuity Plans. FAA has drafted a plan and is revising it. FAA has doubled its efforts to assure union participation in the development of its plan. Two key unions are involved--Professional Airways Systems Specialists (PASS) and National Air Traffic Controllers Association (NATCA). It is essential that FAA and its major unions agree on the actions proposed in the contingency plans. In case of unexpected system failure, it is the members of these unions that must continue operations. FAA has successfully used Memorandums of Understanding in the past to document agreements with unions for ATC modernization projects. No such agreements were in place as of April 2, 1999.

## Outreach to Industry and the International Community

DOT has taken an active role in reaching out to the transportation industry and is getting more information from the private sector on their Year 2000 preparedness. Our sense of industry readiness is the same as that of the Senate Special Year 2000 Committee, namely, the major passenger and cargo carriers are managing the

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<sup>2</sup> The Vessel Traffic System at Prince William Sound is scheduled to be replaced by October 1999.

Year 2000 preparation well. Our confidence level with regard to the entire industry, particularly small carriers and suppliers, would be stronger if a certification of Year 2000 compliance was required of them. The Federal Transit Administration has notified its grantees to submit compliance certifications by June 1999 (see attachment 2). FAA had such a plan last year, but it was withdrawn. In our opinion, key components of the aviation industry should be required to provide assurances that its mission-critical systems are Year 2000 compliant, just like OMB is requiring of all Federal agencies.

Regarding airports, GAO's work strongly indicates that Year 2000 compliance efforts in this area need to be stepped up substantially. GAO noted that many airports are not following a comprehensive and structured approach for repairing systems and, consequently, are at risk of experiencing some equipment malfunctions.

While DOT is getting close to fixing its internal systems and becoming more informed of the private sector's Year 2000 readiness, the same level of comfort does not exist with international transportation readiness, such as foreign air traffic control. While DOT is working with international organizations, it has not received assurance of their members' readiness. Answers are needed for the "unknowns." In our opinion, policy should be developed as to whether U.S. carriers or U.S. code share flights, cargo and passengers, will be allowed to fly to countries that are not known to be Year 2000 compliant. The current strategy is limited to issuance of travel advisories, which implies travel to countries whose ATC system may not be Year 2000 compliant will be discretionary.

## **RECOMMENDATIONS**

We recommend the Federal Aviation Administrator:

1. Take action to require key components of the aviation industry, such as passenger and cargo carriers, to provide certification of Year 2000 compliance no later than November 1, 1999, or such earlier date that FAA deems appropriate.
2. Develop a policy as to whether U.S. carriers, or U.S. code share flights, cargo and passengers, will be allowed to fly to countries for which there is not a credible base for concluding their air traffic control systems are Year 2000 compliant.

## **ACTION REQUIRED**

Please provide written comments within 30 days, to include specific actions taken or planned for each recommendation.

We appreciate the courtesies and cooperation of DOT and FAA representatives. If we can answer questions or be of further assistance, please call me at (202) 366-1959, or my Deputy Inspector General, Raymond J. DeCarli, at (202) 366-6767.

2 Attachments

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cc: Federal Aviation Administrator  
Commandant, Coast Guard  
Acting Chief Information Officer

**Before the Subcommittee on Government Management, Information, and  
Technology, House Committee on Government Reform, and the Subcommittee  
on Technology, House Committee on Science**

**U.S. House of Representatives**

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For Release on Delivery  
expected at  
10:00 a.m. EST  
Monday  
March 15, 1999  
Report Number: FE-1999-072

## **The Year 2000 Technology Challenge at the Department of Transportation**

**Statement of**  
**The Honorable Kenneth M. Mead**  
**Inspector General**  
**U.S. Department of Transportation**



Mr. Chairman, Madam Chairwoman, and Members of the Subcommittees:

We appreciate the opportunity to testify today on the Year-2000 computer program within the Department of Transportation (DOT) and the Federal Aviation Administration (FAA). Our testimony today will address these areas:

- Status of actions to fix DOT and FAA Year-2000 problems,
- Challenges ahead for DOT and FAA, and
- Outreach to the transportation industry and international community.

**First**, in February 1998, we testified on DOT's Year-2000 computer problems before these same two Subcommittees. At that time, we testified that FAA was 7 months behind the Office of Management and Budget (OMB) schedule for assessing its computer systems for Year-2000 problems, and had not yet completed its assessments. There were serious questions as to whether the Host computer, which is used for control of high altitude air traffic, could make it to the Year 2000 or be made compliant, and FAA was planning to finish its Year-2000 work in November 1999.

We recommended FAA establish strong central management for its Year-2000 efforts and establish a sense of urgency, make a prompt decision on whether to repair or replace the Host computers, and move up the implementation date to June 1999. FAA has done so. Since then, a great deal of progress has been made by DOT and FAA. But, the job is not done, and there is much still to do.

DOT has 607 mission-critical systems, 309 of which had Year-2000 problems that had to be fixed. All but 5 have been fixed. As of March 12, 1999, 64 percent of DOT's mission-critical systems are compliant. DOT will not meet OMB's March 31 milestone to have all systems compliant. It expects to be 85 percent compliant by the end of March, 99 percent by June, and fully compliant by October 1999. FAA and Coast Guard account for 90 of the 91 systems that will not be ready by March 31. FAA plans to finish its work by June 1999, and Coast Guard plans to be done by October 1999.

**Second**, we have a much higher level of confidence today than we did a year ago that DOT's mission-critical systems, such as air traffic control, will be Year-2000 compliant before October 1999. It should be recognized that FAA has fixed at least one of each mission-critical system that required repairs, and the repaired work has been tested in a test-center environment. FAA is now making that same repair to multiple units of the same system at air traffic facilities in the field. For example, 65 of FAA's Air Traffic Control systems have computers that must be fixed at about 3,700 locations.

No matter how extensive the search, there are no guarantees that all Year-2000 glitches will be found. So, prudent management dictates that DOT prepare workable Business Contingency and Continuity Plans. In FAA's case, the plans have yet to be completed. They should be accomplished in cooperation with its labor unions whose members will keep the system operating if unexpected failures should occur.

**Finally**, DOT has taken an active role in reaching out to the transportation industry, which has resulted in a high level of Year-2000 awareness. As for the U.S. airline industry, FAA, the Air Transport Association, and the industry itself have made considerable efforts at Year-2000 outreach and awareness.

Our sense of industry readiness is the same as that of the Senate Special Year 2000 Committee, namely, the major passenger and cargo carriers are managing the Year-2000 preparation well. Our confidence level with regard to the entire industry, particularly small carriers and suppliers, would be stronger if a certification of Year-2000 compliance was required of them by November 1999. FAA had such a plan last year, but it was withdrawn. The reporting required by OMB and the Secretary, in effect, requires such a report with respect to systems under Federal control, but not from the industry itself.

Regarding airports, GAO's work strongly indicates that Year-2000 compliance efforts in this area need to be stepped up substantially. GAO noted that many airports are not following a comprehensive and structured approach for repairing systems and, consequently, are at risk of experiencing some equipment malfunctions.

While DOT is getting close to fixing its internal systems and becoming more informed of the private sector's Year-2000 readiness, the same level of comfort does not exist with international transportation readiness, such as foreign air traffic control. DOT has been working with international organizations, such as the International Civil Aviation Organization and the International Maritime Organization. Both organizations have had "industry days" to increase awareness of the Year-2000 problem. However, DOT has not received status report of their members' Year-2000 readiness. Because of this, there are lots of "unknowns."

Answers are needed for the "unknowns." In our opinion, policy should be developed as to whether U.S. carriers or U.S. code share flights, cargo or passengers, will be allowed to fly to countries that are not known to be Year 2000 compliant.



## **Current Status**

OMB established a five-phase approach for addressing Year-2000 computer problems. Milestones established by OMB are:

Year-2000 Phases and Milestones

<b>YEAR-2000 PHASES</b>	<b>TASKS</b>	<b>OMB TARGETS</b>
Awareness/Assessment	Determine Scope of Year-2000 Problems	<b>June 1997</b>
Renovation	Fix Year-2000 Problems	<b>September 1998</b>
Validation	Test the Fix	<b>January 1999</b>
Implementation*	Install Year-2000 Compliant Systems	<b>March 1999</b>

\*A system is not counted as "implemented" until the fix is installed at all field locations and tested.

DOT has 607 mission-critical systems, of which 309 needed to be fixed (renovated) in order to be Year-2000 compliant. As of February 28, 1999, the status of the 309 systems that needed to be fixed was:

	<b>Systems</b>	<b>Renovated</b>	<b>Validated</b>	<b>Implemented</b>
DOT	309	304 (98%)	248 (80%)	101 (33%)
FAA	151	151 (100%)	116 (77%)	41 (27%)
USCG	66	61 (92%)	52 (79%)	2 (3%)

FAA expects to complete all of its Year-2000 work by June 30, 1999. The following chart shows FAA still has lots to do, in a short time, to implement the fixes for its 151 mission-critical systems.

	Systems	Implemented 2/28/99 (Actual)	Implemented 3/31/99 (Projected)	Implemented 6/30/99 (Projected)
FAA	151	41 (27%)	97 (64%)	151 (100%)
ATC	65	21 (32%)	34 (52%)	65 (100%)

One of the systems that received a lot of attention at the last hearing, and has since been repaired, is the existing Host computer. FAA initiated procurement of new Host computers, but it also took action to repair the existing computers. FAA contractors did not identify any Year-2000 problems with the Host microcode (machine language) that would preclude transition into the next millenium. FAA plans to complete replacement of the existing Host computers by October 1999. The replacement is on schedule. So far, replacement systems have been installed for use at 10 of the 26 centers.

Coast Guard has identified 66 mission-critical systems requiring Year-2000 fixes and has repaired 61 systems. One of its systems--the Vessel Traffic System on Prince William Sound--will not be repaired until October 1999. This system controls ship movements in maritime ports. The delay occurred because Coast Guard decided to replace, rather than fix, the old system.

## **Challenges Ahead**

### **Testing of Repaired Systems**

The Department has completed testing over 80 percent of the repaired mission-critical systems. Our office has performed independent reviews of selected systems, and alerted senior management to issues requiring further actions. For example, on February 12, 1999, we reported that there was inadequate support for test results on 5 of the 7 ATC systems we reviewed. The documentation problems we found does not necessarily mean that the fixes have not been made. It is possible that the staff at the location that did the work can demonstrate that the job was done properly. In fact, at two locations where we did an extended review, this was the situation. We are currently reviewing the remaining three systems.

FAA currently is performing "end-to-end" tests of selected ATC systems in the areas of flight monitoring, weather, communications, and remote system maintenance. These tests simulate real time air traffic operations, to include

interfacing with multiple ATC systems. While an important step in the process, end-to-end testing is not a substitute for the individual ATC system testing.

FAA plans to perform four end-to-end tests on 30 to 40 ATC systems. FAA has completed two tests, and plans to complete the rest by April 1999. These tests are performed primarily at the FAA Technical Center with test machines on-site, not the hundreds of computers and scenarios that make up the real ATC environment. Tests that have been done to date were successful with only minor glitches. FAA plans to do field site testing at the Denver En-route Center in April on systems that are operational in the field.

Interfaces with foreign air traffic control organizations are not part of these end-to-end tests. FAA knows 12 of its 20 En-route centers interface with foreign countries to handle international flights. FAA plans to test interfaces with seven international countries--Canada, Mexico, Japan, Bahamas, United Kingdom, Dominican Republic, and Cuba--which account for 60 percent of international flights. These plans are not yet finalized.

Coast Guard also has interdependent systems which, if not working together, could disturb its critical missions. Coast Guard currently is planning its End-to-End testing work.

### Implementing Repaired Systems

With less than 300 days to the Year 2000, DOT still has significant challenges ahead. FAA is facing a unique implementation challenge. The ATC system fixes, after being operated in test-center environments, have to be installed at multiple sites throughout the system. For example, the Terminal Doppler Weather Radar system provides detection of weather events such as wind shear and microbursts. FAA renovated the computer used to support this system, and has to install it at 47 sites. Implementing repairs into the real operational environment has risk due to potential complications resulting from local adaptations to ATC systems (changes made by local technicians). In the past, FAA has encountered problems installing test-center solutions at locations throughout the ATC system due to local changes.

FAA has 21 of the 65 ATC systems that have been fixed, tested, and installed at field sites. The remaining 44 systems are the most complex, and have to be installed at about 3,000 field sites in the next 3 months. This very aggressive schedule has to be carried out in conjunction with the development of other major ATC modernization projects, such as the Host replacement system.

As of February 28, 1999, Coast Guard has implemented only 2 of its 66 mission-critical systems. Like FAA, Coast Guard also has to install repaired

systems at multiple sites. Some of the "sites" are vessels stationed or operating at sea. Installation of repaired systems can be done only when vessels are in port, which causes delays in implementation of compliant systems.

### Completing Business Continuity and Contingency Plans (BCCP)

The development of a BCCP is needed in the event of computer failures. Of the 12 DOT Operating Administrations, 4 have completed draft BCCPs. The others are in the development process.

For FAA, a draft business continuity plan has been prepared and is currently being revised. FAA also has been trying to get more union participation, especially from its two key unions, Professional Airways Systems Specialists (PASS) and National Air Traffic Controllers Association (NATCA). In case of unexpected system failure, it is the members of these unions that must continue operations. So far, NATCA and PASS have not played as active a role as they need to in FAA's development of its contingency plan. It is essential that FAA, and its unions, develop contingency plans acceptable to, and agreeable by, all parties. DOT needs to step up its efforts to complete this important task.

## **Outreach to Industry and International Partners**

DOT has taken an active role in increasing the transportation industry awareness of Year-2000 problems, and is making financial assistance available through DOT's grant programs. These actions are paying dividends because DOT is getting more information from the private sector on their Year-2000 readiness.

Our sense of industry readiness is the same as that of the Senate Special Year 2000 Committee, namely, the major passenger and cargo carriers are managing the Year-2000 preparation well. Our confidence level with regard to the entire industry, particularly small carriers and suppliers, would be stronger if a certification of Year-2000 compliance was required of them by November 1999. FAA had such a plan last year, but it was withdrawn. The reporting required by OMB and the Secretary, in effect, requires such a report with respect to systems under Federal control, but not from the industry itself.

The Year 2000 computer problem has important implications for the aviation industry, including airports, aircraft manufacturers, parts suppliers, air carriers, and repair stations at home and abroad. As recently reported<sup>1</sup> by the GAO, U.S.

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<sup>1</sup> General Accounting Office, Year 2000 Computing Crisis: Status of Airports' Efforts to Deal with Date Change Problem, (GAO/RCED/AIMD-99-57), January 1999.

airports have made progress in preparing for the Year 2000. GAO noted that many airports are not following a comprehensive and structured approach for repairing systems and, consequently, are at risk of experiencing some equipment malfunctions.

While DOT is getting close to fixing its internal systems and becoming more informed of the private sector's Year-2000 readiness, the same level of comfort does not exist with international transportation readiness, such as foreign air traffic control. DOT has been working with international organizations, such as the International Civil Aviation Organization and the International Maritime Organization. Both organizations have had "industry days" to increase awareness of the Year-2000 problem. However, DOT has not received any status report of their members' Year-2000 readiness.

We are working closely with the Secretary and Deputy Secretary, the Federal Aviation Administrator, the Commandant of the Coast Guard, and the Department's Acting Chief Information Officer to make sure DOT's Year-2000 program goes as smoothly as possible. We will continue to monitor the issues we have discussed, and advise the Congress, the Secretary and Deputy Secretary of Transportation, the Federal Aviation Administrator, and the Commandant of the Coast Guard of progress and problems.

Mr. Chairman, Madam Chairwoman, this concludes our statement. I would be pleased to answer any questions.



U.S. Department  
Of Transportation  
**Federal Transit  
Administration**

The Administrator

400 Seventh St. S.W.  
Washington, D.C. 20590

October 16, 1998

Dear Transit Authority Chair:

As soon as the Federal Transit Administration (FTA) began working on Year 2000 (Y2K) issues in 1996, we became aware of the fact that one of the main goals we had to establish and meet was to provide Y2K information, guidance, and assistance to the transit community and grantees--our customers.

In April 1998, FTA distributed a "Dear Colleague Letter" to the transit community forwarding the Department of Transportation's (DOT) Y2K five-phase approach that is described in the DOT Best Practices Manual. This document is intended to provide in-depth guidance which may be beneficial in helping our customers meet their organization's Y2K requirements.

FTA established a partnership with the American Public Transit Association (APTA) in June 1998, in an effort to provide further guidance to the transit community. One of the outcomes of this partnership is a survey that APTA coordinated with its members. The survey queried the respondents on the status of all Y2K efforts directly related to Automated Data Processing (ADP) and Intelligent Transportation Systems (ITS).

More than half of those surveyed have responded. The results from this survey indicate that only 20 percent of the transit systems are in compliance with Y2K requirements. Another major Y2K concern is funding. With TEA-21, the Administration and Congress have provided record levels of funding for transit. Funding is available under TEA-21's new rail and bus capital investment programs, sections 5307, 5309, 5310, and 5311 for Y2K compliant investments. This includes new investments and fixed guideway modernization programs. Efforts to bring ITS projects into compliance are eligible for funding through TEA-21's major transit programs, just as basic ITS investments qualify.

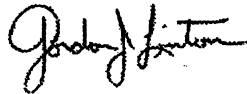
FTA would like to emphasize that under the Capital and Formula Grant Programs, grantees are required to have the legal, financial, and technical capability to carry out the project. Technical capability encompasses Y2K; hence, grantees must be Y2K compliant to receive funds from FTA. We want you to make Y2K your main priority, so much so that we have developed the following action items and target dates that are in line with the DOT Best Practices Manual. These include:

<u>Phase</u>	<u>Action Item</u>	<u>Date</u>
Assessment	Identify all information technology (IT) systems, solutions, cost, and schedules.	January 1999
Renovation/Validation	Correct and test all non-Y2K compliant IT issues	March 1999
Implementation	Incorporate all Y2K compliant IT systems into production	June 1999

To further reinforce FTA's concern and avoid the serious consequences that are inevitable if Y2K is ignored, we are requesting that you forward a letter of compliance for your mission critical systems that are ready for implementation to us by **June 30, 1999**. Your letter needs to state that you have completed the aforementioned action items by June 30, 1999, and are thus Y2K compliant. If, for some reason, you are unable to meet this deadline, we request a letter by June 30, 1999 outlining your contingency plans for continuing operations of your systems while repairing or replacing the calendar year 2000 non-compliant elements.

Your Y2K compliance letter will serve as certification that you are technically and financially capable of administering FTA funds under TEA-21 statutory requirements, securing your continued and future FTA support well into the 21st Century.

Sincerely,



Gordon J. Linton